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Primary Teachers' Recommendations for the Development of a Teacher-Oriented Movement Assessment Tool for 4–7 Years Children

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Primary teachers' recommendations for the development of a teacher-oriented movement assessment tool for 4-7 year children

Abstract

To inform the development of a teacher-oriented movement assessment tool, this study aimed to explore primary school teachers' perceptions of assessing fundamental movement skills (FMS) within Physical Education (PE) lessons. Thirty-nine primary school teachers of PE, located in the United Kingdom, participated in an individual or group in-depth interview. Findings signify that teachers perceive a need for a movement assessment tool that is simple for them to use, quick to administer, and that provides valuable feedback to guide future teaching and learning. This is vital as teachers indicated a lack of appropriate resources and a shortage of curriculum time restricts their use of assessment within PE. A movement assessment tool that was integrated on a digital technology platform could increase teachers' understanding of assessing FMS and enhance children's learning of FMS.

Keywords: Fundamental movement skills, assessment, primary teachers, physical education

Fundamental movement skills (FMS) are grouped into three sub-categories of skills: stability (e.g. one leg balance, walking along a line), object control (e.g. overhand throwing, kicking a ball) and locomotor (e.g. running, hopping, skipping) (Gallahue, Ozmun, & Goodway, 2012). Fundamental Movement Skills are the foundation of more complex skills and movement patterns that are developed to use within organised and non-organised games and sports (Barnett, Stodden et al. 2016; Hands, 2012), and are considered to play an important role in the physical and social development of children through adolescence and into adulthood (Clark & Metcalfe, 2002). It is preconceived that children have the potential to be competent in performing FMS by the age of seven years (Gallahue et al., 2012; Payne & Isaacs, 2011), with children who are competent at performing FMS being considered to exhibit movement competence (Morgan et al., 2013). Seefeldt (1980) hypothesised that children who do not achieve a sufficient level of movement competence, failing to pass through the 'proficiency barrier', will be inhibited when engaging in sports and games. In recent years, a number of systematic reviews (Barnett, Lai et al., 2016; Cattuzzo et al., 2016; Lubans, Morgan, Cliff, Barnett, & Okely, 2010) have revealed a positive association between FMS competence and physical activity levels during childhood and adolescence. Of note, Foweather et al. (2015) reported that in early childhood (participants aged 3-5 years), FMS competence was positively associated with physical activity levels across the week. Similarly, in later childhood (participants aged 6-10 years), De Meester et al. (2018) found that children with high levels of FMS competence spent a greater amount of time each day being physically active. Thus, demonstrating that the 'proficiency barrier', described by Seefeldt (1980), may well exist and that an emphasis should be placed on developing FMS competence from early childhood, to equip children with the skills to be physically active during childhood and into adolescence.

The need to address development of FMS competence within PE (Physical Education) during early childhood is reflected in curriculum guidelines globally (Australian Curriculum Assessment and Reporting Authority, 2015; Department for Education, 2013; Ontario Ministry of Education, 2015; Society of Health and Physical Educators America, 2016). For instance, the most recent PE curriculum for the United Kingdom states 'pupils should develop fundamental movement skills…. mastering basic movements including running, jumping, throwing and catching, as well as developing balance, agility and co-ordination' (Department for Education, 2013). It has also been recommended that primary school teachers become more involved in assessing children's FMS to subsequently support their development (Morley, Till, Ogilvie, & Turner, 2015). Furthermore, assessing FMS in early childhood would highlight those children with low levels of movement competence and allow for appropriate curriculum guidance or interventions to be introduced to improve movement competence (Lopes, Rodrigues, Maia, & Malina, 2011).

Assessment within education is categorised in two forms: summative assessment and formative assessment (Hay, 2006). Summative assessment is a broader term for the Assessment of Learning (AoL) and is a formal process to measure what has been learned (Hay, 2006). Formative assessment is recognised as Assessment for Learning (AfL), and is a measuring process used by the teacher to provide feedback to children and modify future teaching to address their needs (Black & Wiliam, 2010; Hay, 2006). According to Hay and Penney (2009), assessment within PE should be viewed as a process through which learning can be promoted, with AfL being introduced as the principal form of assessment. Further, they state that an integral element of assessment is that it aligns with the curriculum and pedagogy. It has long been understood that teacher-led assessment is a key element in the Teaching-Assessment-Learning cycle

(Carroll, 1994; Roberton & Halverson, 1984) by providing a teacher valuable feedback to improve standards of learning (Black & Wiliam, 2010). Therefore, assessing children's FMS competence could help teachers to support and enhance the development of their pupils (Herrmann, Gerlach, & Seelig, 2015; Stodden, Langendorfer, & Roberton, 2009; Tidén, Lundqvist, & Nyberg, 2015).

Fundamental Movement Skills are typically developed during early childhood (Gallahue et al., 2012), with primary school potentially providing the optimal environment for this to take place (Morgan et al., 2013). In the UK, primary school PE can be delivered by generalist class teachers and specialist PE teachers. Generalist class teachers teach across all subjects and receive as little as six hours training to teach PE during Initial Teacher Training (ITT) (Harris, Cale, & Musson, 2012), whereas PE specialists have completed a minimum one-year training course for teaching PE and are responsible solely for teaching PE. Less than half of UK primary schools employ a PE specialist teacher, meaning PE lessons are largely taught by generalist class teachers (Department for Education, 2015). Due to the limited amount of PE training allocated to generalist class teachers, it is reported that they lack expertise and confidence in assessing children within a PE setting (Harris et al., 2012; James, Griffin, & France, 2005; Morgan & Bourke, 2008; Morgan & Hansen, 2007; Ní Chróinín & Cosgrave, 2013). Owing to their limited PE training, generalist class teachers will be referred to as non-specialists going forth in this study.

The limitations of existing FMS assessments for use by teachers in school settings are well reported (Cools, de Martelaer, Samaey, & Andries, 2008; Giblin, Collins, & Button, 2014). Traditional methods for assessing children's FMS were typically designed for physical therapists and researchers to measure movement deficiencies (Cools, et al., 2008). The clinical process of these assessments does not suit

the authentic teaching environment of a typical PE lesson, deeming them unsuitable for use by teachers of PE in a school setting (Giblin et al., 2014). Further, the composition of existing assessments of FMS competence, such as the Bruininks-Oseretsky Test of Motor Proficiency, Second Edition (BOTMP-2) (Bruininks & Bruininks, 2005) that assesses fine and gross motor control, leads to limited curricular validity for the PE syllabus of children aged 4-7 years old as they do not contain a component to assess competence of stability skills. The inclusion of a wide range of skills across existing assessments could be due to the initial purpose of each assessment and the context, and by whom, they are to be administered. For example, the Körperkoordinationstest für Kinder (KTK) (Schilling & Kiphard, 1974) was intended to assess gross motor co-ordination, thus does not contain any object control component. As Tompsett, Sanders, Taylor and Cobley (2017) suggest, further investigation is required to define the format and content of a FMS assessment for primary school teachers to use.

In recent years, a selection of movement assessment tools have been developed with teachers and practitioners in mind as the assessor (Canadian Assessment Movement Skill and Agility [CAMSA]: Longmuir et al., 2015; Motorische Basiskompetenzen [MOBAK]: Herrman et al., 2015). The CAMSA (Longmuir et al., 2015) is intended for children aged 6-14 years old and requires children to complete a movement-based course including seven skills that reflect 'real world' abilities. The CAMSA is feasible, reliable and valid for use by Secondary school teachers of Year 7 girls PE (Lander, Morgan, Salmon, & Barnett, 2016; Lander, Morgan, Salmon, Logan, & Barnett, 2017). However, the feasibility and reliability of the protocol when administered by non-specialist teachers of PE in primary schools has not yet been examined. Furthermore, the CAMSA's method of assessment, allowing only one child to be active at a time during the assessment process, poses a potential challenge for a

primary teacher to conduct the assessment whilst managing a class of children. The MOBAK **(**Herrmann et al., 2015), an FMS assessment designed for teachers, aligns itself to the specifics of the primary PE curriculum, and reports to be a valid and appropriate movement assessment tool suitable for teachers (Herrmann et al., 2015). Despite these claims, it is not clear whether the design and validation of the assessment involved consultation with teachers, thus there is little understanding to the appropriateness of the selected assessment method for primary school teachers who have limited PE training and subject understanding. To provide teachers with a movement assessment tool that meets the specific context of PE lessons in the initial years of primary school, it was important to explore their perceptions of assessing FMS competence and gain their recommendations for a preferred method of assessment. As discussed earlier, primary school PE is delivered by both specialists and non-specialists of PE, therefore it was considered essential to gain the perspectives of both of these groups of teachers.

Therefore, the purpose of this study was to examine the perceptions of primary school teachers in order to i) understand their existing practice of assessing FMS and ii) establish key recommendations for the development of a teacher-oriented movement assessment tool, aligned to the PE curriculum for children aged 4-7 years old. This study formed part of a wider research programme to develop a movement assessment tool for primary school teachers in the United Kingdom.

Methodology

A stratified purposeful sampling strategy (Patton, 2015) was used to recruit participants. Schools were identified from Local Authority contact lists of the two participating cities, and from information provided by the research partner (the Youth

Sport Trust). Invitation packs, containing a letter and participant information sheet, were sent via email to the headteacher of each school (N =104), with the request to share with their teaching staff. Teachers were asked to respond directly to the lead researcher via email or telephone. The lead researcher made follow up telephone calls to each school if a response was not received from the initial invitation. Upon accepting the invitation, potential participants were asked to sign a consent form and provide demographic information (length of teaching experience, their role in school and gender). Using this pre-determined stratification criteria, thirty-nine teachers of PE from twenty primary schools based predominantly in two cities in the North of England were recruited to participate. The participant sample comprised: gender (female, n=27, male, n=12), length of teaching experience (Mean = 8.1 years, SD = 6.4 years), teaching role (PE specialist, n=8; PE co-ordinator, n=12; generalist teacher, n=19), school location (urban, n=32; and rural, n=7) and school status (state, n=34; and independent, n=5).

Due to early difficulties with recruitment (cited reasons from teachers included lack of time available, problems caused by examination periods, and absence through illness), the study was divided into two phases separated by the schools' summer holiday period in 2015. Phase One interviews were conducted in June and July and involved 17 primary school teachers located in the North East (n=12) and North West (n=5) of England. Phase Two interviews were conducted between September and November 2015 and involved a further 22 primary school teachers located in the North East (n=12), North West (n=9) and South West (n=1) of England. Prior to commencing research activity, approval was granted by the ethics committee of (*institution and reference to be added following the review process).*

Interviews

In-depth interviews using a semi-structured interview guide (Patton, 2015) were used to explore the thoughts and experiences of the interviewees. The interviews were structured to examine two key research questions: 1) What are primary school teachers' perceptions of assessment within PE? 2) What do primary school teachers consider the most suitable method of assessing children's movement within PE?

Using the style described by Berg (2009), the interview schedule was constructed around the key conceptual areas of interest that had been identified to investigate the research questions (see Table 1). The stages of the interview schedule centred on 'essential' questions, with 'informal' questions included at the beginning to build rapport and focus attention on the subject of the interview (Berg, 2009). Probes and prompts, such as 'can you explain in more detail why you think this?', were used to elicit more information if a respondent's initial answer was unclear or incomplete (Gillham, 2005). To assess the effectiveness of the interview schedule, Gillham (2005) recommends conducting pilot interviews with a real sample of participants. Three pilot interviews were conducted with primary school teachers. Analysis of the data from the pilot interviews, and feedback from the pilot participants, resulted in the reduction of the number of scripted questions from sixteen to twelve and amendments to the wording of some questions to language more understandable for teachers. These revisions focused the interview schedule on the areas of most importance and provided additional time for extra non-scripted probing questions to be used to seek additional, unexpected information (Kvale & Brinkmann, 2009).

[Insert table 1 here]

Participants were offered the choice of individual interviews or group interviews using the identical interview schedule. Group interviews were conducted with members of staff from the same school, and allowed multiple participants to be involved at convenient times during their school day (for example, lunch times and after school). To encourage participation within the group setting, participants were informed that they were free to contribute at any point (Fontana & Frey, 2008) and the lead researcher moderated the discussion to mitigate a dominant voice taking over (Berg, 2009). Fourteen individual and nine small group interviews were conducted, each lasting 35-40 minutes. Small group interviews comprised two (*n*=5), three (*n*=3) and six participants (*n*=1). Individual and group interviews were conducted face-to-face at the participant's school (*n*=33), via online video conferencing (*n*=4) and telephone (*n*=2). As previously discussed by Iacono, Symonds and Brown (2016), interviews conducted via online video conferencing were deemed as effective as having face-to-face interaction.

Following Phase One data collection, an initial analysis was conducted and key recommendations from teachers for an assessment protocol were formed. Following this analysis, a storyboard (See Figure 1 for a sample of the storyboard) was digitally created to provide a visual representation of the process and content of the movement assessment tool as recommended by teachers in Phase One. Subsequently the storyboard was shown on a laptop computer to teachers during interviews in Phase Two to provide focus and stimulate the discussion (Cross & Warwick-Booth, 2016). The storyboard was first introduced to participants during Stage Three of the interviews, which focused on the format of the movement assessment tool. The preceding stages of the interview schedule remained unchanged from Phase One to retain consistency between the two phases and to allow comparisons across the interviews (Berg, 2009). Separating the interviews into two phases and creating the storyboard allowed the data

collection in Phase Two to focus participants' attention (Hoepfl, 1997), which encouraged further recommendations for the appropriate design of the movement assessment tool.

[Insert figure 1 here]

Data analysis

All interviews were digitally recorded (Sony IC recorder ICD –PX140), transcribed verbatim and subsequently managed within NVivo analysis software. Employing Saldaña's (2012) notion of first cycle coding, descriptive coding was used to inductively identify topics within the data, which related to the research questions. For example, in relation to the research question 'What do primary school teachers consider the most suitable method of assessing children's movement within PE?' the topic of 'technology' became apparent and mentions of this topic were subsequently coded appropriately. Second cycle 'pattern' coding was then performed, following the principles of the constant comparison method (Morehouse & Maykut, 2002; Saldaña, 2012). This cycle of coding entailed the lead author reading the transcripts again to assess patterns through the recognition and development of themes formed by the discrete topics as determined within the first cycle of coding. Within this second cycle of coding, the themes were continuously compared and contrasted with each other to form an explanatory framework that revealed the social processes that teachers encountered (Taylor, Bogdan & DeVault, 2015). This hybrid approach of inductive and deductive processes provided a thorough exploration and analysis of the research questions by comparing existing beliefs around teachers' perceptions of assessment within PE, as determined by the research questions contained within the semi-structured

interview schedule, as well as allowing for the development of new themes (Boeije, 2010).

Findings

This study explored primary teachers' perceptions of assessing children's FMS to inform the development of a teacher-oriented FMS assessment. To better understand the context of primary teacher-led assessment of FMS, it was also important to examine how participants perceive assessment within PE and discover how they include assessment within their own teaching. Therefore, the findings are presented under the headings of the two key areas of investigation: i) Primary school teachers' perceptions of assessment within PE; and ii) Primary school teachers' recommendations for a movement assessment tool to use in primary schools, which consequently formed the key themes of the analytical framework. Within each of the key themes, participants' experiences and perceptions are discussed within the emergent sub-themes (See Table 2).

[Insert Table 2 here]

Primary school teachers' perceptions of assessment within PE

This section highlights the participants' perceptions of assessment within PE and discusses their current assessment practice within the subject. Participants' perceptions were defined in the following areas; i) the role of assessment in PE, and ii) access to assessments.

The role of assessment in PE. Teachers in this study recognised the value of assessment to support children's development in PE, yet they were also aware that not all assessment has the same influence, "I really do want to feel that it's making a difference. I wouldn't want it to become something, sort of just paperwork, and think 'Well actually, how much is that going to help?'" (PE specialist, male, 13 years' experience). Participants also recognised the value of assessment for recording children's progress. One participant explained *"We have a tick list with perhaps three different criteria on it, and we just look to see where they are over a few lessons, so to see if they move or if they stay the same"* (Year 2 teacher, female, 3 years experience). Additionally, it was also recognised that assessment within PE will become more important to justify budgetary spending in the subject, as one participant suggested, "We need to get a focus on assessment in PE, again with Sports Premium funding, [OFTSED] want to know how the children are making progress and I think very soon we are going to be answerable for progress". (PE co-ordinator, female, 30 years' experience).

In 2013, the UK government allocated PE and Sport premium annual funding to schools to spend solely on "additional and sustainable improvements to the quality of PE" (Department for Education, 2018). Schools are accountable for how this money is spent and are required to monitor and report the impact that funding has on pupil outcomes. However, due to the current absence of formalised or statutory assessment within PE (Department for Education, 2013), participants reported that, currently, the main purpose of assessment was to report to parents at the end of the year. Objective based mark sheets were used by some teachers to assess competence in PE, with participants using AfL strategies to evaluate and monitor children's development. These approaches are best captured by the following teachers, one a PE specialist and the other

a non-PE specialist; “We’re really into AfL…, and making those judgements as we’re going. We want to respond to what we see - not think about it afterwards, and that’s really important to us.” (PE specialist, male 7 years teaching experience) and “Crucial to observing these things is whether the children are able to do these things, that always tells me as a practitioner that developmentally something isn’t right, which sometimes can mean there are actually implications.” (EYFS teacher, female, 6 years experience).

The value placed by participants towards AfL, indicated in the above quotes, suggests that a process-oriented scoring approach would be preferred for a teacher-oriented movement assessment tool. A process-oriented assessment evaluates movement based on the completion of pre-defined behavioural criteria. This qualitative approach to assessment indicates to the teacher which aspects of the movement each child may need to develop and is an effective assessment method for AfL (Tidén, Redelius & Lundvall, 2017). The following quote exemplifies how teachers felt this format of assessing children’s FMS would aid their teaching; "You see a child not managing something, and I can see from that what they’re doing wrong, give them that verbal feedback, and then off they go." (Year 4 Teacher, female, 4 years’ experience). A number of previous studies have recommended that teachers implement assessment methods that utilise an AfL approach to enhance children’s learning (Black & Wiliam, 2008; Hay & Penney, 2009; MacPhail & Halbert, 2010; Tidén et al., 2015). Specifically, MacPhail and Halbert (2010) reported that secondary school teachers of PE improved the standard teaching, learning and assessment in their PE lessons after implementing AfL within their lessons. However, to be used effectively, this requires the assessor to have prior knowledge of what they are assessing (Tidén et al., 2015). Therefore, cautious steps to consider the level of subject knowledge required by the assessor must be taken when assessments involve process-oriented scoring and AfL

approaches are to be used by teachers who do not have in-depth knowledge of what they are assessing (Tidén et al., 2015). Recommendations of how teachers can be supported when conducting the assessment are discussed further within *assessment functionality* below.

Access to assessments. Participants indicated that they use a range of sources to access information to support their PE curricular knowledge, including training and resources offered by their Local Authority, bought in resources (e.g. Real PE, Create Development) and online resources (e.g. Youtube). However, as exemplified below, participants reported a shortage of suitable assessment tools that they can access to assess FMS:

> "We've got the PE coach doing a skills assessment at the end of each topic that he does, but in regard to tracking that across the school from Key Stage 2 anyway, or even maybe Key Stage 1, with the exception of Foundation Stage, possibly, I'd say there's something lacking." (Year 4 teacher, male, 3 years' experience).

These results are in agreement with the suggestion made by Giblin et al. (2014) that there are a shortage of FMS assessment tools available to primary school teachers. Morgan et al. (2013) suggested that primary school should provide an optimal environment for children to develop FMS. However, with only a limited number of PE specialists in primary schools, it is imperative that FMS assessment resources are designed for the specific needs of non-specialists of PE. Furthermore, the removal from the curriculum of national level descriptors (Association for Physical Education, 2014), which were a guideline for assessing children's progress, leaves schools and teachers in

a position requiring them to create their own assessment framework. These findings indicate that providing teachers with more guidance and support in assessing PE may encourage more meaningful assessment to take place within the subject.

Recommendations for an FMS assessment tool

The previous findings revealed participants' experiences of assessing within PE, highlighting the need, and desire from primary teachers, for a method of assessing children's FMS. The following section discusses the key recommendations made for an appropriate method of assessing children's FMS in lesson time. This topic is discussed within the three sub-themes that developed from the analysis illustrating participants' perspectives for the movement assessment tool; i) available teaching time, ii) nature of the assessment, iii) assessment functionality.

Available teaching time. A key issue raised by participants was that they feel pressured within school by the shortage of available curricular time for PE, "Time is of a massive issue as our lessons are only 40 minutes long for a single lesson" (PE specialist, male, 16 years' experience). Typically, it seems other subjects, such as English and Maths, are given higher importance and take priority, "We track English and Maths really well, and we track writing and reading, but then the other things almost fall at the wayside sometimes." (Year 4 teacher, female, 3 years' experience); "They [School] concentrate more on Maths, English and Science for the constant reporting." (PE Teacher, male, 7 years' experience). These comments could be a result of assessment within core subjects, unlike PE, being a statutory requirement in the UK (Department for Education, 2013). This phenomenon might also be indicative of what Berliner (2011) terms 'curriculum narrowing', which results in the increase of testing in

core subjects and subsequent increased curriculum time being afforded to these subjects as seen in British and American schools. Conversely, for example in the United Sates, in spite of policy guidance that suggests mandating Physical Education for all school children (Centers for Disease Control and Prevention, 2011), it is subjected to a reduction in time by as much as a third (McMurrer, 2008). However, the situation is different in the UK with reports suggesting that the recommended 120 minutes of Physical Education curriculum time is being met in the majority of cases (Australian Curriculum Assessment and Reporting Authority, 2015; Foster, 2018), even though the UK government does not set a target for how much time schools dedicate to PE.

To make assessment more attractive to primary school teachers to include within their current teaching of PE, participants stipulated that the movement assessment tool needs to follow a simple process and be quick to administer, with a Year 1 teacher suggesting "It just has to be easy. It has to not be time consuming and it has to tell staff what they are looking for. What they should be doing, what the children should be doing." (Year 1 Teacher, female, 30 years' experience).

Nature of the assessment. The findings presented here describe teachers' recommendations for the process of assessing children during the PE lesson. Participants implied that the value of the movement assessment tool would be improved if the results positively impacted on their future teaching and the learning experience of their pupils. To achieve this, teachers indicated that they want to be able to record more than just the outcome of the assessment and that just saying 'yes' or 'no' for a child's outcome is not enough, "Some sort of generic criteria that says their achievement is at this level, or that they're achieving but their achievement is at a basic level". (PE specialist, male, 18 years' experience). In relation to scoring the assessment,

participants recommended that the movement assessment tool needs to record evidence of what the child has achieved and that it establishes a record of their progress that can be monitored:

> "Things I like are where it's there and it's almost quite clear and you go tick, so you almost have it recorded, you're not having to go away and process it or think about it. It can be within the lesson, it's not too onerous." (PE co-ordinator/Year 5 teacher, female, 9 years' experience)

Furthermore, it was suggested by participants that they want the movement assessment tool to provide valuable feedback that will facilitate a positive influence within their future lesson planning:

> "…. Having an assessment tool that takes that into account – that you're not just looking for the children you know. You're breaking the assessment down. For example, if they can't run straight or backwards, whatever it is, you have that process in place so the teacher can say 'Right, this child can't do this. I know to get them to here they need to do this, this and this'." (Year 4 teacher, male, 3 years' experience).

This notion by the participants that the value of the movement assessment tool would be enhanced if it provided feedback to the teacher to support learning aligns to the principles of authentic assessment in PE outlined by Hay and Penney (2009). In this manner, the systems within the assessment to support AfL are necessary to both measure children's competence and inform future teaching. In response to being shown the storyboard of the movement assessment tool (See Figure 1 for a sample of this), a

participant interviewed in Phase Two of this study recommended that a criterion scoring approach would be preferable:

> "I like it being able to just click on the name and say which criteria they've fulfilled so you've got a log next to each child saying what they've done and showing what level they are working at whether its above, at or below." (EYFS, female, 12 years' experience).

Assessment functionality. The interviews provided insight into participants' recommendations of features within the assessment tool that would aid them in assessing children's FMS and be beneficial as a teaching tool. Participants indicated that a lot of the resources that are currently available to them are paper-based. However, many perspectives of this were negative, with one participant reflecting "We need to get rid of paperwork, and I know that's what we're doing at the moment but we don't have any technological resources to help us" (Year 1 teacher, female, 1 year experience). This notion of using digital technology was recommended by another participant, who expressed "It would be so much easier on a tablet for me, because it would be quicker to just sit there and just go through it" (PE co-ordinator, male, NQT). The potential of using digital technology within PE has previously been recognised by Graham, Holt/Hale and Parker (2013), who suggested that the popularity of tablet devices could revolutionise assessment practices by reducing paperwork and increasing efficiency.

In this current study, it was suggested by some participants that including video demonstrations of the skills to assess would be a valuable support to them, "one thing that would be amazing would be if it's something that you don't know how to teach, it gives you a clip of what should be done" (Year 4 teacher, male, 6 years' experience). Notably, having the facility to show video clips demonstrating the skill to the children

was deemed important, "You could project that onto a wall or whatever and show the children, so you've got that demo and you can press play, this is your demonstration and everything, this is your performance mirrored next to it" (PE specialist, male, 16 years' experience). Participants who were non-PE specialists, suggested that being low in confidence in the subject deterred them from providing demonstrations to their class or that their demonstrations were not adequate. Therefore, including video content in the assessment resource could both support teachers' understanding in effectively administering the assessment, as well as offer an alternative demonstration method so that children can be shown the movement skill performed correctly, thus potentially enhancing their learning opportunities (Chan, Ha, & Ng, 2016).

In addition to having a library of video content provided within the assessment tool, participants highlighted that being able to video record the performance would provide visual evidence of what the child has achieved. Participants also recognised the potential benefit of being able to replay the videoed performance back to the child to support the child's development. This was epitomised by one participant's reflection from their teaching;

> "[The child] knew straight away and he was able to fix it. Whereas I'd said to him a couple of times before, I got the iPad and as soon as he saw [his movement] on the iPad he sorted it." (Year 5 teacher/PE Co-ordinator, female, 9 years' experience)

There is already acknowledgement that video recording is a useful tool to enhance learning (Graham et al., 2013), and using digital video for feedback and self-assessment in PE has been shown to enhance children's motivation and improve their skill performance (O'Loughlin, Chróinin, & O'Grady, 2013). Furthermore, assessing

movement skills from video can be simpler for an untrained assessor (Gard & Rösblad, 2009) and the hand-held nature of the tablet enables the teacher to be mobile during the assessment and record the performance from different angles. Research on the use of digital app based technology within schools is limited, however, in a recent study, Browne (2015) indicated the advantages that teachers reported with using tablet applications within their teaching of PE, including the value of using tablets to record and analyse children's performance. The findings within this theme and the themes discussed earlier, suggest that assessments utilising digital technology would be well received by primary school teachers. The additional functions provided by digital technology to record and capture evidence of children's FMS could encourage teachers to use the movement assessment tool more frequently. This method of assessment could also be adopted for wider curriculum areas within PE, where evaluating performance and recording children's progress is also required.

Conclusion

These findings indicate that primary teachers recognise the significant role that assessment has in enhancing children's learning. However, due to the shortage of movement assessment tools for primary teachers to use, participants in this study relied upon their own, sometimes limited, knowledge and expertise to implement assessment of FMS. In general, there is demand from primary school teachers for a movement assessment tool, so that they can enhance the learning environment for children and better support their development of FMS. Participants recommended that an effective movement assessment tool should be simple to use, quick to administer and provide valuable feedback to guide their future teaching and better support children's learning of FMS.

Participants suggested that the use of digital technology, through the use of tablet devices (e.g. iPads), and video content would assist teachers who require additional guidance to conduct the assessment and enhance learning opportunities. Furthermore, digital technology allows a simple method of scoring and recording data, and does not demand the same attention after the lesson that would be required to maintain paper-based records. A digital app, providing video content and video capture, may enhance the child's learning experience through the additional support provided to teachers to develop children's FMS.

Initially providing teachers with an instructive, mechanical way of assessing FMS may assist in developing their confidence and competence to assess, allowing them to modify their engagement and usage of the movement assessment tool over time. In this way, teachers would maintain their freedom to exhibit and develop their professional practice. This aligns with the notion of assessment in PE being authentic (Hay & Penney, 2009), enabling teachers to customise and refine how they incorporate the movement assessment tool within their teaching to suit their children and the environment that they work within.

In populations, such as the UK, where PE lessons are largely delivered by non-specialists of PE, it is realistic to suggest that the recommendations made for a movement assessment tool in this study are suitable to be used by teachers with a range of knowledge, understanding and confidence in the subject. In populations where PE is delivered solely by PE specialists, these recommendations may need to be reconsidered owing to the greater subject knowledge and confidence of these teachers. However, considering the paucity of literature discussing primary teachers' perceptions of assessing FMS and the shortage of feasible for tools for teachers to use in primary school PE, the findings in this

study provide a meaningful perspective of the issues and considerations for teacher-led assessment of children's FMS in primary school.

Teachers' recommendations described in this study provide a foundation for the development of a movement assessment tool. If suitably aligned to the curriculum, this movement assessment tool could then be used by primary school teachers to enhance the learning environment for children to acquire and develop FMS, providing children with the skills they need to be more physically active throughout childhood and into adolescence (Barnett, Lai et al., 2016; Cattuzzo et al., 2016; De Meester et al., 2018; Foweather et al., 2015; Lubans et al., 2010). Furthermore, with schools being accountable for how they spend the PE and Sport Premium funding, in the absence of other suitable assessment methods, the ideas presented here for the development of a teacher-oriented movement assessment tool could be valuable for teachers and schools to report the impact of how they allocated the funding by monitoring changes in children's FMS competence.

Seeking the opinion of experts of children's movement to generate the content of a movement assessment tool (e.g. the number and type of skills required to assess FMS) is recommended to ensure the assessment provides a valid measure of FMS competence. Future research should investigate the impact of the assessment on teacher-led assessment and the consequential evolution of teaching practice and patterns of change in children's FMS competence.

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